

10/09/2008

Application No.: 10/509,156
Art Unit: 1793

Amendment under 37 CFR §1.116
Attorney Docket No.: 042724

AMENDMENTS TO THE CLAIMS

This listing of claims replaces all prior versions of claims in the application.

1. (Currently amended): A worked molybdenum-alloy material having high corrosion resistance, high strength, and high toughness, comprising:

a recrystallized structure inside the worked molybdenum-alloy material; a nitride-particle-dispersed layer on the recrystallized structure, formed by internal nitriding of a nitride-forming-metal element dissolved in a molybdenum matrix in an untreated worked molybdenum-alloy material, fine nitride particles being dispersed in a worked structure or recovered structure on the recrystallized structure; and

a molybdenum nitride layer on the nitride-particle-dispersed layer, the molybdenum nitride layer having a thickness of 3 μm or less, the molybdenum nitride layer comprising one or more selected from $\delta\text{-MoN}$, $\gamma\text{-Mo}_2\text{N}$, and $\beta\text{-Mo}_2\text{N}$, the molybdenum nitride layer being formed by external nitriding of a worked structure or a recovered structure at the surface of the untreated worked molybdenum-alloy material,

wherein the worked molybdenum-alloy material has a higher yield strength than the worked molybdenum-alloy material without the molybdenum nitride layer on the nitride-particle-dispersed layer.

2-4. (Cancelled).

5. (Currently amended): A method for manufacturing a worked molybdenum-alloy material, comprising the steps of:

internally nitriding an untreated worked molybdenum-alloy material in which at least any one of titanium, zirconium, hafnium, vanadium, niobium, and tantalum is dissolved to form a solid solution in a molybdenum matrix through a multi-step internal nitriding treatment including at least three-step increases of treatment temperature, and then

externally nitriding the worked alloy material through an external nitriding treatment at 900 °C or lower so as to form a molybdenum nitride layer of 3 μm or less,

wherein the worked molybdenum-alloy material has a higher yield strength than the worked molybdenum-alloy material without the molybdenum nitride layer on the nitride-particle-dispersed layer.

6. (Original): The method for manufacturing a worked molybdenum-alloy material subjected to nitriding according to Claim 5, wherein the internal nitriding treatment is performed with a nitrogen gas, and then the external nitriding treatment is performed with an ammonia gas.

7. (Currently amended): A worked molybdenum-alloy material with high corrosion resistance, high strength, and high toughness, comprising:

a worked structure without recrystallization inside the worked molybdenum-alloy material;

a nitride-particle-dispersed layer, on the recrystallized structure, formed by internal

nitriding of a nitride-forming-metal element dissolved in a molybdenum matrix in an untreated worked molybdenum-alloy material, fine nitride particles being dispersed in a worked structure or recovered structure on the recrystallized structure; and

a molybdenum nitride layer with a thickness of 3 μm or less, the molybdenum nitride layer comprising one or more selected from $\delta\text{-MoN}$, $\gamma\text{-Mo}_2\text{N}$, and $\beta\text{-Mo}_2\text{N}$, the molybdenum nitride layer being formed by external nitriding of a worked structure or a recovered structure at the surface of the untreated worked molybdenum-alloy material,

wherein the worked molybdenum-alloy material has a higher yield strength than the worked molybdenum-alloy material without the molybdenum nitride layer on the nitride-particle-dispersed layer.